

What is claimed is:

1. A method of suppressing a peak of a multicarrier transmission signal in a transmission system where filtering processing is performed on each of baseband signals respectively corresponding to a plurality of frequency channels using a filter, the signals subjected to the filtering processing are each multiplied by a predetermined carrier to be single-carrier signals, and the single-carrier signals are combined to obtain a multicarrier transmission signal, comprising the steps of:

branching each of the baseband signals from a regular signal processing route, performing filtering processing on each of the baseband signals branched, multiplying each of the baseband signals branched by the same carrier as the predetermined carrier at the same timing as in multiplication by the predetermined carrier, combining the signals obtained, and thereby obtaining a multicarrier signal for use in calculating a correction value for peak suppression;

detecting an instantaneous peak of the multicarrier signal for use in calculating the correction value, and based on the detection result, obtaining the correction value for peak suppression; and

25 multiplying each of the baseband signals on the regular signal processing route by the correction value to perform correction for peak suppression.

2. The method of suppressing a peak of a multicarrier transmission signal according to claim 1, wherein the step of obtaining the correction value for peak suppression comprises the steps of:

5 detecting a peak value for each of a predetermined items of data; and

calculating the correction value to output, when the current peak value detected exceeds a predetermined threshold and is larger than a last peak value, so that  
10 the correction value adapts to the current peak value, while outputting a correction value corresponding to a peak value obtained immediately before the peak value starts decreasing without updating, when the peak value decreases continuously the number of times that does not  
15 exceed a predetermined number of times.

3. A multicarrier transmission signal generating circuit with peak suppressing function, comprising:

a regular signal processing route for branching each  
20 of baseband signals corresponding to each of frequency channels to multicarrier-transmit to two signal sequences, delaying each of baseband signals in one signal sequence in a delayer, multiplying each of the signals by a correction value for peak suppression in a multiplier,  
25 performing n-time (n is an integer of two or more) interpolation processing on each of the signals multiplied by the correction value, performing filtering

processing on the signals using a filter, multiplying each of the signals by a carrier to obtain single-carrier signals, and combining the single-carrier signals to output a multicarrier transmission signal; and

5           a correction value generating route for performing on each of baseband signals in the other signal sequence substantially the same processing at substantially the same timing as the n-time interpolation processing, the filtering processing, and processing of multiplying by  
10   the carrier to obtain a single-carrier signal in the regular signal processing route, thereby obtaining a multicarrier signal for use in calculating the correction value, detecting an instantaneous peak of the multicarrier signal for use in calculating the correction  
15   value, and obtaining the correction value for peak suppression based on the detection value to provide to the multiplier in the regular signal processing route.

4.    The multicarrier signal generating circuit with  
20   peak suppressing function according to claim 3, wherein timing of multiplication by the carrier in the regular signal processing route is controlled to be timing delayed from timing of multiplication by the carrier in the correction value generating route by a time required for  
25   calculating the correction value and a time corresponding to a group delay of signals associated with the filtering.

5. An adaptive peak limiter comprising:

a plurality of hard limiters which is provided respectively for a plurality of frequency channels having a possibility of containing communication data to which  
5 a predetermined data packet transmission scheme is applied, and limits an amplitude value of a baseband signal of each of the frequency channels using an adaptive limit value provided from outside; and

a limit value table to which access is made using,  
10 as an address variable, on/off bit information indicative of whether the predetermined data packet transmission scheme is applied and another on/off bit information indicative of whether each of the frequency channel is used, both the information being reported from an upper  
15 layer for each of the frequency channels, and which outputs an adaptive limit value as a result of the access to provide to at least one of the plurality of hard limiters.

6. The adaptive peak limiter according to claim 5,  
20 wherein the predetermined data packet transmission scheme is a High Speed Downlink Packet Access (HSDPA) scheme conforming to IMT 2000.

7. The adaptive peak limiter according to claim 6,  
25 wherein the limit value is set in such a manner that a greater limit value is applied to a frequency channel that uses HSDPA than a frequency channel that does not

use HSDPA, and that in a case where an unused frequency channel is present, as the number of unused frequency channels is increased, the limit value for use in a used frequency channel is increased.

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8. A baseband signal processing LSI wherein respective signals of the frequency channels output from the adaptive peak limiter according to claim 5 are input to the multicarrier transmission signal generating circuit with  
10 peak suppressing function according to claim 3, thereby generating a multicarrier transmission signal subjected to peak suppressing processing such that a PAR (Peak to Average Ratio) value and a CCDF (Complementary Cumulative Distribution Function) remain within respective desired  
15 allowable ranges.

9. A CDMA multicarrier transmission apparatus mounted with the baseband signal processing LSI according to claim  
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10. A CDMA multicarrier transmission apparatus comprising:

the baseband signal processing LSI according to claim 8; and

25 a digital-controlled hybrid distortion compensating circuit that performs both pre-distortion processing and feedforward distortion canceling

processing.